


# **A Large-Scale Biometric Identification System at the Point of Sale**

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## **Scope**

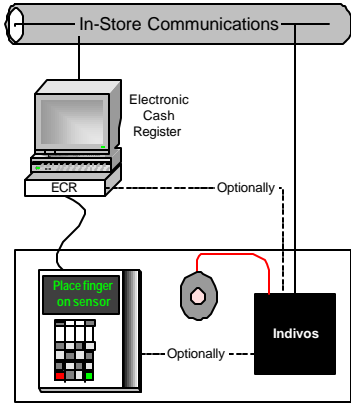

- **Large-Scale**
  - Ubiquitous service
  - Goal of 100-million domestic users
- **Biometric**
  - Fingerprint-based (price/performance, mechanical footprint, and high user acceptance)
  - Personal Search Code used to basket users
- **Point of Sale**
  - Open system (biometric algorithms & sensors)
  - High transaction volume
  - Establish regional hubs with optional in-store servers
    - Facilitates regional rollouts
    - Provides high availability

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## Configuration

- Add sensor to existing POS footprint
- Biometric processing hardware
  - Template extraction
- Fingerprint Sensor
  - Digital Persona U.are.U Pro



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## Steps

- Enrollment
  - Consumer adds account and other information to service
  - Associate biometrics with these records
- Identification
  - Identification at POS returns “wallet” of financial instruments for transactions
  - Related data
    - Loyalty number, frequent flyer number, retailer account, etc.
- Updating
  - Dynamic template updates from statistical measures
  - Consumer allowed to add, update or delete enrolled account information

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## Steps/Enrollment

- **Multi-image enrollment set**
  - 5 images/finger x (1 mandatory + 1 optional) fingers/user
- **Low-impact user training**
  - Sensor enclosure shape
  - Visual collateral, attendant interaction
- **Speed: reasonably fast**
  - “2-minute enrollment”
- **Account data**
  - Credit, Debit, Check/ACH, Rewards/Account info
  - Count the cards in your wallet...

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## Steps/Identification

- **Speed**
  - Must be fast
    - Target: 2 seconds, front-to-back
    - Easy to remember personal search code
- **Focus of Environments**
  - Multi-Lane Retail
    - Speed, though this won't be the limiting factor
    - Rewards, new payment options, check cashing validation, age verification, stored-value/gift cards, ...
  - Quick-Service Restaurant
    - Speed is the primary concern
    - New payment options, rewards hold value

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## Steps/Updating

- Account Updating
  - Account information
  - Biometric information
  - Ability to change your personal search code
- New or augmented current hardware
  - Sensors, Algorithms
  - Modes
    - Iris, facial, voice, etc.
    - Will require multi-modal updating terminals
- All updating (biometrics and account information) needs to be trivially-easy for user

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## Real World

- Cafeteria at Visa's World Headquarters
  - Performance
    - ~3 years, ~50,000 transactions
    - False Accepts: none observed
    - False Rejects (by the end of the pilot)
      - ~ 10% on first placement (~2% expected)
      - ~ 1% by third placement (~0.5% expected)
    - User "Complaints" (Compliments)
    - POS Service Calls
  - Training
    - Bad placement (finger-tip, smears, etc.) is cause of most failures
    - Placement training helps resolve this

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## Real World

- Phase 1 (pilots)
  - Fast-food restaurants: 4 in Fresno, CA and 1 in Sacramento, CA
  - Video rental chain: 1 in Dallas, TX
  - Multi-lane retail: 1 in Oakland, NJ + others
  - Pharmaceutical retailers: locations not yet chosen
- Example: A single QSR in Fresno
  - Consumer Enrollment
    - Enrollees must be at least 18 years of age and have a valid ID card and credit or debit card
    - Potential consumers handed a small informational pamphlet
    - Touch screen kiosk in restaurant
      - open from ~8am to ~1pm and ~4pm to ~8pm seven days per week
    - Enticed with a free hamburger and a weekly sweepstakes
    - Right index is primary (alternatives are index, thumb, middle from either hand)
  - Consumer POS Use
    - 2 in-store lanes using Verifone Everest Plus and Omni 3200

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## Real World

- Example: A single QSR in Fresno
  - Preliminary First Month Performance Numbers
    - Over 500 successful enrollments
    - Over 500 successful purchases
    - False Accepts at POS: **None observed!**
    - False Rejects at POS: **(these are preliminary numbers)**
      - ~93% successful purchase rate for un-trained users
        - Initial high FRR due to bad finger placement (we are continually improving our training to improve FRR)
        - Expect performance to improve to at least ~99% as consumers become familiar with the technology as was observed in our VISA pilot
    - Failure To Enroll (goats): 2 elderly people
      - Improving sensor and algorithm technology will help this
    - Age of successful enrollees: 18 to 80+ years of age
    - Call center volume: **Not a single call!**
    - Only 1 un-enrollment
      - Lady's husband was convinced this was the "Mark of the Beast", and made her un-enroll

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## Closing

- Large-scale biometric identification system at the point of sale
  - Must focus on consumer convenience
    - Trade-off: biometric sample for convenience
  - Must allow voluntary use
  - Must optimize problem for large-scale
  - Must focus on value propositions to all parties
  - Must be able to address the public's privacy and security concerns
    - Biometric use concerns
    - Credit/account and other personal information use concerns
  - Must continue to educate the public on how biometric technology works to dispel the "Mark of the Beast" phobia
    - **Credit cards faced exactly the public phobias when they were first tested!**

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## Indivos Corporation

- About Indivos Corporation
  - Founded in 1995, provides applications of biometrics for access to financial accounts and services.
  - Leader in the application of biometrics at the point of sale.
  - Entering into pilot tests with large supermarkets and world-wide fast-food retailer.
  - Pay By Touch<sup>SM</sup> provides benefits to both consumers and merchants.
  - 16 issued patents covering methods and systems in this space.

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